

UNIVERSITY CURRENTS

A Newsletter For and About the University Nuclear Engineering and Science Community

U. S. Department of Energy

Summer 2000

Dean's Meeting

On September 18, 2000 the Nuclear Energy Research Advisory Committee (NERAC) sponsored a meeting with the Deans of Engineering from U.S. universities at the Crystal City Marriott in Arlington, Virginia. The meeting was hosted by NERAC Chairman James Duderstadt, former President and Dean of Engineering of the University of Michigan. The meeting was held to discuss with the deans the recently completed report by a NERAC "Blue Ribbon Panel" on the status of nuclear engineering education and university research reactors in the U.S. The Blue Ribbon Panel which authored the report, entitled "The Future of University Nuclear Engineering Programs and University Research and Training Reactors," was chaired by the Associate Dean for Academic Affairs, Dr. Michael Corradini, of the University of Wisconsin.

The meeting was a frank dialogue between the university community, NERAC members, and the Department of Energy on how best to ensure the future infrastructure of nuclear engineering education. The issues of support for university research reactors and the relatively small number of students in the nuclear engineering field were the primary topics of the meeting. The Department of Energy is examining the issues confronting the discipline and will respond to the report and an anticipated follow-on report which will be conducted to address additional issues raised at the meeting. Under Secretary Ernest J. Moniz addressed the deans assuring them he was aware of the issues and that the Department has assisted and will continue to assist the university nuclear engineering community in finding solutions to its current problems.

The follow-on report by Dr. Corradini's group will focus upon the refinement of the university research reactor's (URR) qualification criteria and the associated peer-review process in light of new information regarding the uncertain future of several of the larger URR facilities. It is expected that this second report will be completed by March 2001.



Dr. Gary Was discusses nuclear engineering education issues with the Deans of Engineering as part of the University Panel. Left to right are Dr. Lee Saperstine (ABET), Dr. Andrew Kadak (MIT), Dr. Thomas Magnanti (MIT), Dr. James Duderstadt (NERAC Chairman), Dr. Was (Michigan), and Dr. James Anderson, South Carolina State University.



Dr. Michael Corradini briefs the Dean's of Engineering on the NERAC Report findings and recommendations.

www.nuclear.gov

INEEL Students Supported by DOE Office of Nuclear Energy

Eight students sponsored by DOE's Office of Nuclear Energy, Science and Technology participated in summer scholarship awards at the Idaho National Engineering and Environmental Laboratory (INEEL) during the summer of 2000. They were:

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| <i>Shawn Bennett</i> | Texas A&M Univ., Sr., Nuclear Engineering | <i>DePaul Vaughn</i> | Howard Univ., Sr., Electrical Engineering |
| <i>Nakeisha Brown</i> | Southern Univ., Jr., Mechanical Engineering | <i>Gloresca Willis</i> | Univ. of Missouri, Rolla, Sr., Nuclear Engineering |
| <i>Marcus Chisolm</i> | Howard Univ., Jr., Electrical Engineering | <i>Rodrick Wilson</i> | Univ. of Missouri, Rolla, Graduating in December 2000, Nuclear Engineering |
| <i>Mit Goins III</i> | Howard Univ., Sr., Mechanical Engineering | | |
| <i>Hasan Greene</i> | Howard Univ., Sr., Electrical Engineering | | |

Competing with 116 undergraduate students who gave poster or oral presentations to peers in their assigned site areas, Marcus Chisolm and Hasan Greene along with five other students were selected by judges to present at the Annual Scientific Summary on August 2. An audience of over 250 INEEL employees, mentors, students and faculty listened to presentations about various projects students were assigned to this summer.

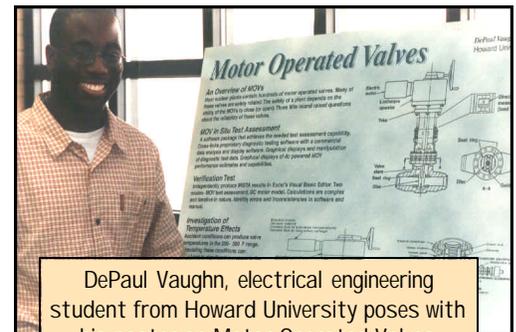
The week before Shawn Bennett, a Texas A&M University nuclear engineering student, arrived at the INEEL, he was elected as President of the Texas A&M Branch of the American Nuclear Society and will be an ANS Student Delegate to Washington, D.C.

Rodrick Wilson was interviewed for potential employment by the Nuclear Engineering Technologies organization before leaving for the summer. He will graduate in December with his bachelor's degree in Nuclear Engineering.

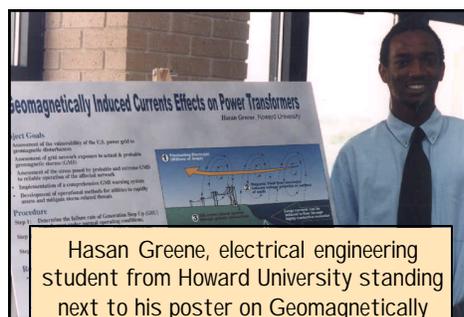
Marcus Chisolm, electrical engineering student from Howard University will present a paper on his project "Neutron Activation Analysis without the Neutron Source" at the American Nuclear Society meeting this November 12-16. Gloresca Willis and Rodrick Wilson also had papers accepted by the American Nuclear Society.

The impact of the summer program was so dramatic that Dr. Eric Loewen from the INEEL and mentor for the two nuclear engineering students from the University of Missouri, Rolla was requested to make a presentation to the nuclear engineering students regarding the projects Gloresca and Rodrick were involved in this summer. Dr. Loewen visited Missouri-Rolla on September 6 and 7.

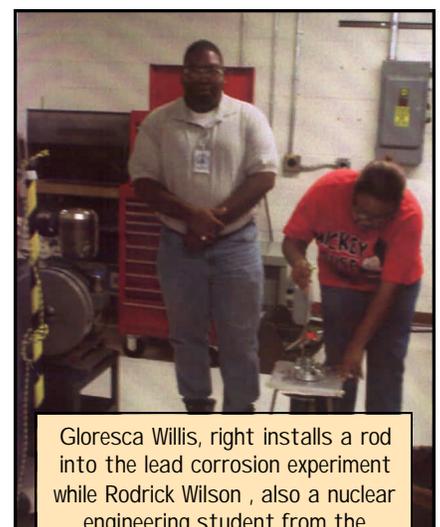
All of the students reported that they enjoyed and learned a lot on their assigned projects. Those eligible would like to return next summer.



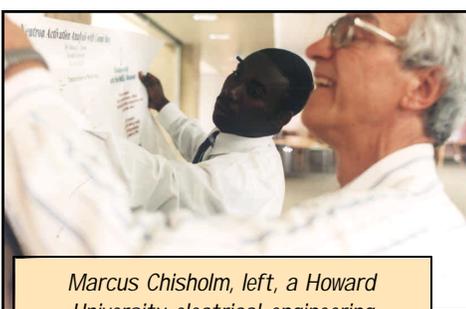
DePaul Vaughn, electrical engineering student from Howard University poses with his poster on Motor Operated Valves.



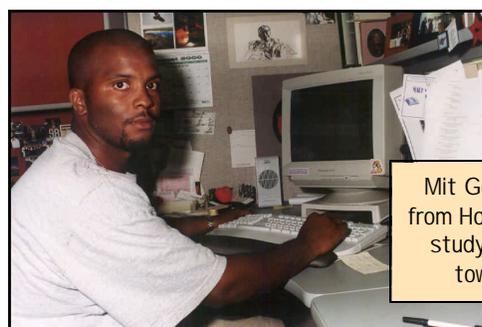
Hasan Greene, electrical engineering student from Howard University standing next to his poster on Geomagnetically Induced Currents Effects on Power Transformers at the Annual INEEL Scientific Summary.



Gloresca Willis, right installs a rod into the lead corrosion experiment while Rodrick Wilson, also a nuclear engineering student from the University of Missouri, Rolla looks on.



Marcus Chisolm, left, a Howard University electrical engineering student, and one of his mentors, Bob Gehrke, hang a poster describing their summer research on Neutron Activation Analysis for the Scientific Summary poster session at University Place.



Mit Goins III, mechanical engineering student from Howard University, works on a computer to study ATR (Advanced Test Reactor) cooling tower and heat exchanger information.

Women in Discovery

Texas A&M Marie Curie Exhibit

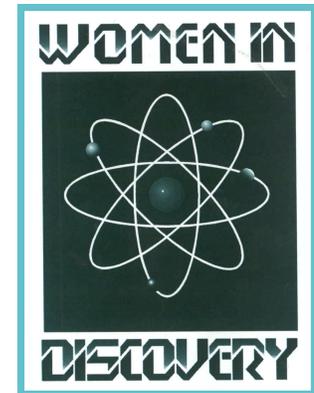
At the beginning of the 21st Century, humanity faces a myriad of scientific questions and technological challenges that will be solved only by creative, dedicated scientists, engineers and educators. We must use every avenue to encourage young women and men to take up the scientific and technical challenges of the next millennium. Because women have not always been directed toward science and engineering, Texas A&M has placed special emphasis on programs that encourage young women, particularly from minority communities, to understand the career and educational opportunities available in those fields, as well as the importance of a technologically and scientifically literate citizenry. The “*Women in Discovery*” project is one innovative approach to this issue. It was designed to help students understand the many accomplishments of the famous women scientists who have gone before and to appreciate the contributions of those currently active in the world of science and engineering.

Beginning in August 1999, Texas A&M University conducted a series of activities designed to celebrate the accomplishments of notable women of science and engineering, and to enhance the understanding of the importance of science literacy to our future. DOE is an active supporter of the “*Women in Discovery*” project participating programmatically and financially at both Texas A&M and the University of Michigan.

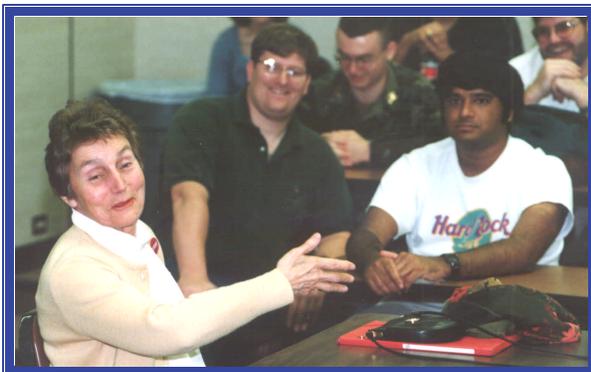
The “*Women in Discovery*” project included an extensive educational outreach program, directed principally at high schools throughout Texas, aimed at increasing the awareness and appreciation of science and engineering and their related technologies that will be necessary to sustain and improve our quality of life in the next millennium.

A set of Marie Curie’s personal laboratory tools, books, and artifacts were the centerpiece of the “*Women in Discovery*” exhibit in the J. Wayne Stark University Center Galleries. This was the first time Madame Curie’s instruments had been brought to the United States, or anywhere outside Europe. The exhibit also included other artifacts in the history of science and technology that provide a living legacy to Madame Curie’s pioneering discoveries, as well as exhibits of new and emerging technologies. Madame Curie’s granddaughter, Dr. Helene Langevin-Joliot, opened the exhibit to an overflow, standing room only crowd on March 2. While on campus, she met with student groups and faculty, as well as giving a lecture at the exhibit opening.

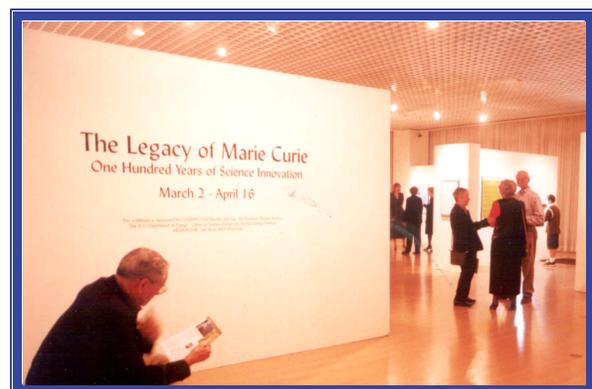
Texas A&M University hosted an international conference March 22-23, 2000, entitled “*Women in Discovery*” symposium, involving living women Nobel laureates and notable women in science from throughout the world.



“*Women in Discovery*”
is a traveling exhibit and
can be seen next at the
University of Michigan
from Oct. 9 to Nov. 3, 2000



Dr. Helene Langevin, Marie Curie's granddaughter speaking to Texas A&M Nuclear Engineering Students



Entry to Exhibit at Texas A&M

South Carolina State & and Wisconsin Sign Articulation Agreement



Officials from SCSU, UW-Madison, and the U.S. Department of Energy at signing of Articulation Agreement. (L-R) Dr. Gilbert A. Emmert (Wisconsin) Dr. Charles. J. Warner (SCSU), Dr. Douglass L. Henderson (Wisconsin), Provost John D. Wiley (Wisconsin), U. S. DOE Office of Nuclear Energy Director William D. Magwood IV, Dean Paul S. Percy (Wisconsin), Dean James A. Anderson (SCSU), Graduate Student Tristan T. Utschig (Wisconsin), and Nuclear Reactor Senior Operator John C. Murphy (Wisconsin).

Increasing the number of minorities pursuing degrees in Nuclear Engineering has come closer to becoming a reality with the recent signing of an Articulation Agreement between South Carolina State University (SCSU) and the University of Wisconsin at Madison (UW-Madison). This landmark agreement is the first of its kind in the Minority/Majority University Program sponsored by the Office of Nuclear Energy, Science, and Technology. As it was described in our Spring 2000 newsletter, the Minority/Majority University Program pairs a minority institution with an institution offering a degree in Nuclear Engineering and allows the minority institution's students to earn a degree from both institutions.

The Articulation Agreement between SCSU and UW-Madison identifies the specific course requirements for the Bachelor of Science and/or Master of Science degree in Nuclear Engineering within their partnership program. The cooperation between these two institutions permitted this document to be crafted and signed in an unprecedented short amount of time. This cooperation was evidence of the commitment by both parties to develop a strong program capable of increasing the diversity in Nuclear Engineering education and the industry. The Agreement was signed on July 13, 2000 at South Carolina State University in Orangeburg, South Carolina and on July 24, 2000 at the University of Wisconsin at Madison. Various representatives of SCSU and UW-Madison as well as William D. Magwood IV, Director of the Office of Nuclear Energy, Science, and Technology, attended the final signing at Madison, Wisconsin.

As noted in the Spring 2000 issue of *University Currents*, the NERAC "Blue Ribbon Panel" to Analyze the Future Of University Engineering and Research Reactors presented its findings at the May 23-24, 2000 NERAC meeting in Arlington, Virginia. The panel's summary findings were focused in three areas; University Nuclear Engineering Programs, University Research and Training Reactors and University - DOE Laboratory Interaction.

Nuclear Energy Research Advisory Committee (NERAC)

"Blue Ribbon Panel"

To sustain the University Nuclear Engineering Programs in the United States the panel recommends:

- Enhancing the graduate student pipeline by increasing doctoral fellowships to 20, masters scholarships to 40 with funds of \$5 million per year.
- Establishing a Junior Faculty Research Initiative Grant Program to assist universities in recruiting and retaining new faculty in nuclear science and engineering.
- Increasing the NEER program to \$20 million per year to expand research discoveries in nuclear science and engineering.
- Helping to improve the undergraduate nuclear science and engineering discipline.
- Encouraging and supporting a national effort in communication and outreach to identify nuclear science and engineering benefits for the country.

To strengthen University Research and Training Reactors the panel recommends:

- Establishment of a competitive peer-reviewed program to augment the current DOE financial support for these reactors. This award program would:
 - Specify award criteria which qualify university reactors for participation in the competition
 - Provide peer-reviewed competition for innovative research, training and/or outreach proposals
 - Award multi-year grants that could involve multi-university and multi-disciplinary collaborative teams
 - Provide awards for research, training and/or outreach purposes with the total competitive program funds at a level of \$15 million annually

To increase collaboration between universities and laboratories the panel recommends:

- Increased Nuclear Engineering and Health Physics Fellowships as a means of laboratories interacting with top graduate students
- Increasing personnel exchanges between laboratories and universities, such as a "Distinguished Visitor Program", where university faculty could spend extended periods at laboratories and laboratories could encourage their staffs to present seminars at universities
- A Designated University Awards program where DOE could negotiate a percentage of the laboratories budget to be subcontracted to universities

If you would like to obtain a copy of the full report, go to the DOE/NE website (nuclear.gov). Go to Advisory Committees, then Reports and finally click on May 10, 2000.

"Nuclear Science and Engineering" Summer Course 2000 A Success

Twenty-eight Missouri secondary science teachers participated in Missouri University's course on "Nuclear Science and Engineering" from June 26-30, 2000. The Summer 2000 course represents the 18th consecutive year that MU has offered a course specifically designed for introducing secondary science teachers to nuclear science and engineering. Over 350 teachers have participated. Financial support from the U.S. Department of Energy / American Nuclear Society, as well as AmerenUE, the Missouri University Research Reactor, and the University of Missouri have made this possible.

Participants in the class cited their primary motivations in attending this course as:

Learning more about fundamental principles of nuclear science to increase their comfort level in teaching the subject (*which helps overcome their lack of knowledge and experience in the field that contributes to their reluctance to teach nuclear science, which usually only occurs at the end of the school year if time allows*);

Acquiring a better understanding of the many applications of nuclear science and technology in our society; and to acquire hands-on educational activities and laboratory demonstrations that they can conduct with their students (*which also helps overcome reluctance to teach the subject*).

The MU class is designed specifically to respond to these needs and to foster continuing relationships to help support secondary nuclear education.

The curricula this year was augmented with an equipment grant from the ANS for acquisition and distribution of Geiger Mueller counters to the class participants. A special class session was held to familiarize the teachers with the GM counter technology. This session, led most successfully by Christopher Graham (AmerenUE Health Physicist), was

an excellent opportunity to help support the teachers in successfully implementing the GM counters for secondary classes in physics, biology, chemistry, and math.

Field trips supporting class lectures and demonstrations included tours of:

The MU Low Level Radiation Laboratory (*during which five teachers had K-40 readings taken to determine lean body mass*);

The Harry S. Truman Memorial Veteran's Administration Hospital nuclear medicine facilities (*class participants were able to observe diagnostic and therapeutic applications of nuclear science, as well as visit the Radio-pharmaceutical Sciences Institute research facilities devoted to development and testing of new drugs for cancer and other human disease*).

The Missouri University Research Reactor Center (*which included general facility tours and a computerized simulation of nuclear power plant operations, as well as an analysis of each teacher's toenail clippings using neutron activation analysis to determine nutritional selenium levels*); and

The Callaway Nuclear Power Plant (*including a tour of the general facility, the operations simulator and training center, and a demonstration of personnel protection in which the teachers dressed out in a complete set of anticontamination clothing*).

The Summer 2000 course was effective in meeting the objective of improving nuclear science education by enhancing classroom content. The University of Missouri continues to be impressed with the quality of teachers that participate in our summer courses, and the enthusiasm that they bring to their profession for both learning and teaching.

Nuclear Engineering Professors Tour French Nuclear Power Facilities



American Professors at COGEMA-Cadarache, July 19, 2000.

Twelve U.S. nuclear engineering professors recently visited nuclear power facilities in France as guests of the French Section of the American Nuclear Society. The one week tour in mid-July included spouses who visited local French cultural attractions while the professors visited technical facilities including the following: the Civaux Nuclear Power Plant near Poitiers, the Framatome Pressure Vessel/Steam Generator Manufacturing Plant near Lyon, the MOX fuel fabrication facility at Cadarache near Marseille, the Fuel Reprocessing Facility at La Hague, and the low-level waste repository at Soulaisne. The tour covered most of France from Cherbourg on the English Channel to Marseille on the Mediterranean Sea. U.S. participants included Brian and Edith Hajek (Ohio State), Gary and Lee Ann Was (Michigan), Henry and Sandy Spitz (Cincinnati), John and Suzanne Valentine (Georgia Tech), Larry and Carol Miller (Tennessee), Bill and Pat Martin (Michigan), Yassin and Melinda Hassan (Texas A&M), Jim and Sandi Stubbins (Illinois), Barry and Julie Ganapol (Arizona), John and Dot Christenson (Cincinnati), Doug and Felicitas Henderson (Wisconsin), and Lee and Pat Dodds (Tennessee). The host and Tour Leader was Jean-Louis Nigon of Cogema who received assistance from Henry Herbin of EdF and Jacques Delaferte of OECD. Lee Dodds served as the U.S. Coordinator. The tour was a tremendous success from both a technical and cultural perspective.

NEER Solicitation & URI Update

The Nuclear Engineering Education Research (NEER) grant solicitation was available on September 13, 2000. There have been some changes in the solicitation. The length of the solicitation has been reduced to a 9 page document. In addition, 11 forms that used to be required with the proposals have been eliminated. For the proposals that are selected, these forms will still be needed but not until a much later date. Approximately \$1.9 million, of the \$5.0 million appropriated, is expected to be available for new NEER proposals this year which should result in about 18 new awards. The due date of the proposals is November 16, 2000. NEER is a grant program designed to promote innovative nuclear engineering research at U.S. universities with a nuclear engineering program and/or possessing a nuclear research reactor which would be used in the conduct of the research. For more information contact Nancy A. Elizondo at elizonna@id.doe.gov or (208)526-4169.

The University Reactor Instrumentation (URI) solicitation was posted October 4, 2000. This program provides funding for university reactor upgrades. The deadline for applications will be December 5, 2000. Additional information about this program is being e-mailed to reactor managers. Both solicitations can be reached at nuclear.gov and www.id.doe.gov.

Progress Noted in the Radiochemistry Education Award Program (REAP)

Over the past year, the three universities with radiochemistry education awards have been active in hiring new faculty members, developing new course work, supporting students with scholarships and internships at national laboratories and establishing new partnerships among academic departments. Although all three universities with REAP awards have been actively recruiting new faculty members, Clemson University, in the hiring of Dr. James Navratil, (Missouri-Columbia, Clemson, and Washington State) is the first school successful in their search. This inability to hire faculty members for these positions is reflective of the national need for radiochemists.

Other highlights for the year include:

- The establishment of four new radiochemistry courses including a neutron activation analysis course at Washington State University (WSU) and an Actinide Chemistry course at Clemson University.
- The integration of radiochemistry topics into the mainstream undergraduate and graduate curricula at all three universities receiving REAP funding.
- The implementation of faculty research and student internships at the Savannah River Site, Los Alamos National Laboratory and the Idaho National Engineering and Environmental Laboratory.
- The receipt of external funding for Clemson University to establish a Research Associate position in Radiochemistry.
- The appointment of twelve graduate students in radiochemistry at the three award universities.

For further information about the radiochemistry program, contact Craig Williamson at 865 494-7069 or cwilliamson@msn.com.

American Nuclear Society's 2000 Women's Achievement Award

Congratulations to Dr. Kathryn McCarthy, Idaho National Engineering and Environmental Laboratory, for being selected for the American Nuclear Society's (ANS) 2000 Women's Achievement Award. Kathy has been a leader in the fusion energy sciences and is also the lead technical support for the Nuclear Engineering Education Research (NEER) program and is involved in the University Reactor Instrumentation (URI) program through the Office of Nuclear Energy, Science and Technology. The award presentation will be made at the Awards Luncheon on November 14, 2000 during the ANS Winter Meeting in Washington, D.C.

DOE Reactor Sharing and Matching Grant Program Solicitation

The Reactor Sharing and Matching Grant program will be announced in the Commerce Business Daily and electronic applications will be sent to all qualified schools in October 2000. The deadline for submitting applications will be January 22, 2001 with grants announced in mid-April 2001 and awards disbursed later in the fiscal year. All institutions with nuclear engineering programs and a private sector match up to \$60,000 are eligible for the matching grant program while all institutions with university research reactors qualify for the reactor sharing program. The evaluation process will be different for both grants this year. Pay close attention to the guidelines outlined in the electronic mailing. For further information, contact Joe Gutteridge at (301)903-1632 or at John.Gutteridge@hq.doe.gov or Craig Williamson at (865)469-7069 or at cwilliamson@msn.com.

October 17-20, 2000

Annual TRTR Meeting

The National Organization of Test, Research and Training Reactors (TRTR) 2000 Annual Meeting is being held October 17-20, 2000 in Raleigh, North Carolina, at the Velvet Cloak Inn, located at 1505 Hillsborough Street, Raleigh. This year's meeting is being hosted by North Carolina State University, Department of Nuclear Engineering, and the Nuclear Reactor Program. All TRTR members, and other interested persons, are invited to attend and participate. For registration information please contact TRTR Inc. at (301)295-1290 or online at trtr@simelectronics.com.

For additional information or submission of articles for publication, please contact:

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